

**Notice of Allowability****Application No.**

10/633,654

**Examiner**

MUHAMMAD N. EDUN

**Applicant(s)**

AKSELROD ET AL.

**Art Unit**

2627

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☐ This communication is responsive to \_\_\_\_.
2. ☒ The allowed claim(s) is/are 1-41.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some\* c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS ( as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review ( PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date \_\_\_\_
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date \_\_\_\_
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other \_\_\_\_

*Prior Art Citation*

**The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.**

Rossant et al. (6,630,349), Brandner et al. (5,206,514) and Bartolini et al. (4,313,188), all discloses an information recording and reproducing apparatus having a recording medium including aluminum oxide.

*Reasons For Allowance*

**The following is an Examiner's Statement of Reasons for Allowance:**

**Re Claims 1-21**

The prior art of record alone or in combination does not teach or suggest the method having the combination of steps and taken the claims as a whole in combination with:

- (a) exciting a luminescent data storage medium with an optical source to thereby cause said luminescent data storage medium to emit a fluorescent light signal, wherein said luminescent data storage medium comprises A1203 and wherein said optical source emits a read laser beam having a wavelength in the range of an absorption band of said luminescent data storage medium', and**
- (b) measuring said laser induced fluorescence light signal from said luminescent data storage medium, to thereby read said information stored on said luminescent data storage medium, wherein said luminescent data storage medium comprises'.**

a base material comprising  $\text{Al}_2\text{O}_3$ ;

a first dopant comprising magnesium', and

**a second dopant comprising carbon, wherein said luminescent data storage medium includes a plurality of at least one type of oxygen vacancy defect, and wherein said luminescent data storage medium includes at least one color center having: an absorption bands in the regions of 250+5 nm, 335+5 nm and 620+10 nm, an emission in the region of 750+10 nm, and a 80+10 ns lifetime.**

#### Re Claims 22-27

The prior art of record alone or in combination does not teach or suggest the method having the combination of steps and taken the claims as a whole in combination with:

**providing a luminescent data storage medium comprising  $\text{Al}_2\text{O}_3$ ; and writing said information to said luminescent data storage medium with an optical**

**source, wherein said luminescent data storage medium has an orientation of the optical c-axis parallel to the direction of the light propagation of said optical source.**

#### Re claim 28

The prior art of record does not teach or suggest writing method for writing on luminescent data storage medium comprising  $\text{Al}_2\text{O}_3$  along with:

**writing said information to said luminescent data storage medium with an optical source, wherein said luminescent data storage medium has an orientation of the optical c-axis perpendicular to the direction of the light propagation of said optical source and wherein the vector of polarization of said optical source rotates synchronously with the rotation of said luminescent data storage medium, and maintains the optical c-axis of the crystal parallel to the polarization direction of the optical source.**

**Re claim 29**

The prior art of record does not teach or suggest writing method for writing on luminescent data storage medium comprising Al<sub>2</sub>O<sub>3</sub> along with:

- (a) exciting a luminescent data storage medium with an optical source to thereby **cause said luminescent data storage medium to emit a fluorescent light signal**, wherein said luminescent data storage medium comprises Al<sub>2</sub>O<sub>3</sub> and wherein said optical source emits a read laser beam having a wavelength in the range of an absorption band of said luminescent data storage medium', and **wherein said luminescent data storage medium has an orientation of the optical c-axis parallel to the direction of the light propagation of said optical source**;
- (b) measuring said laser induced fluorescence light signal from said luminescent data storage medium, to thereby read said information stored on said luminescent data storage medium.

**Re claim 30**

The prior art of record does not teach or suggest writing method for writing on luminescent data storage medium comprising Al<sub>2</sub>O<sub>3</sub> along with:

- (a) exciting a luminescent data storage medium with an optical source to thereby cause said luminescent data storage medium to emit a fluorescent light signal, wherein said luminescent data storage medium comprises Al<sub>2</sub>O<sub>3</sub> and wherein said optical source emits a read laser beam having a wavelength in the range of an absorption band of said luminescent data storage medium; **and wherein said luminescent data storage medium has an orientation of the optical c-axis perpendicular to the direction of the light propagation of said optical source and wherein the vector of polarization of said optical source rotates synchronously with the rotation of said luminescent data storage medium, and wherein said c-axis of the crystal maintains parallel to the polarization direction of the optical source'**, and
- (b) measuring said laser induced fluorescence light signal from said luminescent data storage medium, to thereby read said information stored on said luminescent data storage medium.

**Re claims 31-34**

The prior art of record alone or in combination does not teach or suggest the method of erasing information stored on a luminescent data storage medium comprising Al<sub>2</sub>O<sub>3</sub> having:

(b) illuminating said luminescent data storage medium with an optical source to thereby erase said information, wherein said luminescent data storage medium comprises'

a base material comprising Al<sub>2</sub>O<sub>3</sub>;

**a first dopant comprising magnesium; and**

**a second dopant comprising carbon, wherein said luminescent data storage medium includes a plurality of at least one type of oxygen vacancy defect, and wherein said luminescent data storage medium includes at least one color center having: an absorption bands in the region of 250+5 nm, 335+5 nm and 620+10 nm, an emission in the region of 750+5 nm and a 80+10 ns lifetime.**

**Re claim 35-41**

The prior art of record alone or in combination does not teach or suggest the apparatus having the combination of element taken the claim as whole in combination with the luminescent data storage medium comprising Al<sub>2</sub>O<sub>3</sub> , and

**a means for rotating said luminescent data storage medium and means for rotating of the vector of polarization of said optical source, wherein an optical c-axis of said luminescent data storage medium rotates synchronously and is parallel to the vector of polarization of said optical source.**

Any comments considered necessary by applicant must be submitted no later than the payment of the Issue Fee and, to avoid processing delays, should preferably **accompany** the Issue Fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MUHAMMAD N. EDUN whose telephone number is 571-272-7617. The examiner can normally be reached on FLEXITIME.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hoa Nguyen can be reached on 571-272-7579. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



**MUHAMMAD N EDUN**  
**Primary Examiner**  
**Art Unit 2627**